BROOKHAVEN NATIONAL LABORATORY

User Proposal and Request for Beam Time for the NASA Space Radiation Laboratory (NSRL) or Tandem Van de Graaff Radiobiology Laboratory

Proposal No: E-49 **Date:** 28/07/2014

1. Proposal Type: ☐ Animals ☐ Cells/Tissues (human or animal) ☐ Physics ☐ Other

☐ New Proposal ☒ Renewal ☐ Replacement Proposal replaces proposal no.: ☐ "Piggyback" Proposal (limited to one run only)

2. Title of Experiment: An Active Water-Based An Active Water-Based Liquid Scintillator Phantom Therapy Quality Assurance

Funding Source: Technology Maturation Award

Grant Title & Number: TM-14-02: Effect of proton irradiation on water based liquid scintillator light yield and transparency

Grant Start Date: June 2014 Grant End Date: May 2015

*Dates must cover runs being requested

3. Principal Investigator: David E. Jaffe

Department: Physics

Institution: Brookhaven National Laboratory

Mailing Address: Physics Dept 3-212, Upton, NY 11793-5000

Telephone: 631 344 5518 Fax: 631.344.4741 Email Address: djaffe@bnl.gov

4. BNL Account No.: (see guidelines, page 3) 09750

5. Beam Time Request Summary

Requested Facility and Run: NSRl 15A

Requested Ions/Energies and Times: *(please use Beam Time Calculation Table in enclosed Excel spreadsheet)* protons at 210 MeV for 1 hour and ten minutes

6. Signature

As Principal Investigator/Spokesperson for this proposal, I certify that everything in this proposal is accurate to the best of my knowledge and that my research team will abide by the rules and regulations of Brookhaven National Laboratory. I also certify that the work described in this proposal is not proprietary and upon completion will be published in the open literature.

PI/Spokesperson Signature: David E. Jaffe **Date:** 29/07/2014

Please sign and submit this front page (hard copy) to Ms. Leah Selva, NSRL Administrator, Brookhaven National Laboratory, 50 Bell Avenue, Biology Dept., Bldg. 463, Upton, NY 11973-5000. In addition, please submit the entire completed application electronically to nsrladmin@bnl.gov.

7. Detailed Beam Time Request: ***Please use Att. 6 Beam Time Calculation Table for beam requests. Requests for sequential beam must be completed on a separate beam time calculation table, see Notes section of Att. 6 for details.***

A. List equipment and materials to be provided by the beamline (items furnished by BNL):

~23 cm thick polyethylene absorber
mounting table
signal and high voltage cables from the NSRL physics room to the beam line

B. List equipment and materials to be provided by the user group (items you will bring to BNL):

~200 25mm diameter x 60mm polyethylene vials filled with different formulations of water-based liquid scintillator
2 polyethylene panels specially fabricated to hold 24 vials in the 20cm x 20cm proton beam
2 ~1m long 5cm diameter PVC tubes containing a photomultiplier tube (PMT) and capable of holding a single polyethylene vial
signal and high voltage cables for the PMTs

C. Indicate requirements for any special equipment or additional BNL facilities:

8. Personnel: Provide names, citizenships, and contact information for all personnel who will participate in experiments at BNL (use additional sheets if necessary).

Role	Name	Citizenship	Address	Telephone	Email
PI	David E. Jaffe	USA	Physics Dept. BNL	5518	djaffe@bnl.gov
Coworker	Lindsey Bignell	Australia	Physics Dept. BNL	3542	lbignell@bnl.gov
Coworker	Minfang Yeh	USA	Chemistry Dept. BNL	2870	yeh@bnl.gov
Coworker	Sunej Hans	USA	Chemistry Dept. BNL	4992	shans@bnl.gov
Coworker	Richard Rosero	USA	Chemistry Dept. BNL	4992	rrosero@bnl.gov

9. Required Approvals

A. Research Involving Animal Subjects:

Will you use animal subjects in your experiments? ☒ No ☐ Yes Species:

No. of subjects for each run:

Home Institution IACUC approval status:
If approved, provide IACUC protocol no. and approval date; if not approved, provide IACUC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

BNL IACUC approval status:
If approved, provide IACUC protocol no. and approval date; if not approved, provide IACUC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

B. Research Involving Cells or Tissues (human or animal-derived):

Will you use cells or tissues in your experiments? ☒ No ☐ Yes

Cell line/strain or Tissue ID:

Do you have current mycoplasma-free certification from a certified testing laboratory? ☐ No ☐ Yes
Email Ms. Paula Bennett at bennett@bnl.gov at least one (1) month prior to your experiment.

Does use of these cells/tissues require IRB approval (note: commercially-available cells/tissues are exempt)? ☐ No ☐ Yes
If you marked **Yes**, complete the following items below:

Home Institution IRB Approval Status:
If approved, provide IRB Protocol no. and approval date; if not approved, provide IRB protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

BNL IRB Approval Status:
If approved, provide IRB Protocol no. and approval date; if not approved, provide IRB protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

C. Research Involving Recombinant DNA:

Will you use recombinant DNA in your experiments? ☒ No ☐ Yes

Type of recombinant DNA:

BNL Recombinant DNA Advisory Committee Status:
If approved, provide RAC Protocol no. and approval date; if not approved, provide RAC protocol submission date.

☐ Not Approved Submission Date:

☐ Approved Protocol No. Approval Date:

D. Research Involving Hazardous or Radioactive Materials or Procedures:
List all biohazards, chemical hazards (explosive, flammable, toxic, corrosive), and radioactive materials and procedures for using these materials in your experiments (radioactive materials do not include irradiated/activated beam line materials).

The samples are 80% or more water in a mixture with surfactants; None of the materials are hazardous or radioactive.

10. Transportation of Experimental Items/Samples Away from BNL

Will you take experimental items/samples away from BNL? ☐ No ☒ Yes
All radioactive/hazardous material shipments must be arranged through the BNL Hazardous Materials Transportation Group, contact Mr. Bob Colichio (colichio@bnl.gov) for further information.

A. Identify/describe radioactive items/samples:

B. Identify/describe hazardous items/samples:

C. Identify/describe biological items/samples and shipment method:
Include any special handling requirements for TSA/Customs inspections (light sensitive, do not X-ray, etc.).

How will biological samples be transported away from BNL? ☐ Personal/Ground ☐ Personal/Air ☐ Contract Carrier

11. Research Description:
Provide the information requested below as a separate Word document or PDF and attach to this form. ANSWER ALL QEUESTIONS.

A. Experimental Proposal: Provide sufficient detail to justify your beam time request. Proposal is limited to three (3) pages maximum and must include the following information (if you submit your grant progress report for section 11.A.4, the three page proposal limit applies to the remaining sections):

1. Title of proposal (identify proposal as new, renewal, or replacement)
2. Project summary/overview
3. Background and significance
4. Progress report (for renewal proposals, you may submit your most recent funding agency grant progress report; for new proposals, include any supporting preliminary results). This report should include progress accomplished in prior runs, problems encountered and lessons learned, any deferrals, and responses to previous SACRR proposal review items.
5. List of three (3) publications (to assist the SACRR in its evaluation of previous work/experience and project feasibility).
6. Description of PI and team's previous accelerator experience (1 paragraph maximum).

B. Beam Time Request: Provide sufficient detail to justify the amount of beam time you are requesting. SACRR must be convinced that previously awarded beam time was efficiently and judiciously used, and that you will require the full amount of time for your current request. You must also justify the requested ion species. For this section, you must include:

1. Detailed experimental plan for all experiments to be conducted
2. Beam time calculations (see Att. 6 Beam Time Calculation Table. Requests for sequential beam must be completed on a separate beam time calculation table, see Notes section of Att. 6 for details). Include the total time requested for all ions and energies in Beam Time Request Summary (located on page 1).
3. Other information that may be helpful in justifying your beam time request to SACRR (optional).